

5.1 Representing Relations

Introduction

- A set is a collection of distinct objects (in our case numbers).
- An element of a set is one object in the set.

One way to write a set is to list its elements in braces.

For example we can write the set, N, of real numbers from 1 to 5 as:

$$N = \{1, 2, 3, 4, 5\}$$

The numbers 1, 2, 3, 4, and 5 are each an element of the set N.

The order of the elements in the set does not matter

Definition of a Relation:

Representing Relations:

The following relation is written in a table. We can relate the set of athletes to the set of sports they play

Athlete	Sport
Jennifer Botterill	Ice Hockey
Jennifer Jones	Curling
Jeremy Wotherspoon	Speed Skating
Jonathan Cheechoo	Ice Hockey

a) Describe the relation in words.

b) Represent the relation as a set of ordered pairs.

c) Represent the relation as an **arrow diagram**.

- Two ovals represent the sets
- Each arrow associates an element in the 1st set to the 2nd set

- The order of the words in the ordered pairs, and which column and which oval the words are in in the table and arrow diagram are important
- It makes sense to say “*an apple may be the color red*” but does not make sense to say “red may be the color apple”.
- That is, a relation has direction from one set to the other set

Why is the direction of the arrows in the arrow diagram important?



Your Turn: Tourist Attraction and Province.

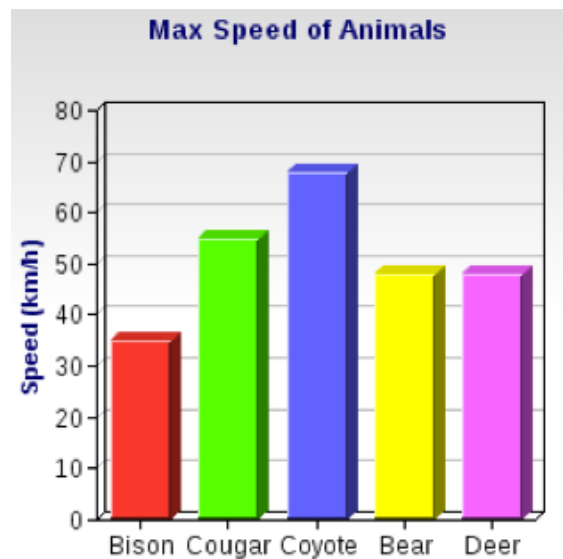
Tourist Attraction	Province
Butchart Gardens	BC
Icefields Parkway	Alberta
Royal Canadian Mint	Manitoba
Stanley Park	BC

- a) Describe the relation in words.
- b) Represent the relation as a set of ordered pairs.
- c) Represent the relation as an arrow diagram.

Example 2: Consider the Relation represented by the following graph. Represent the relation as
a) describe in words

b) a set of ordered pairs

c) a table and

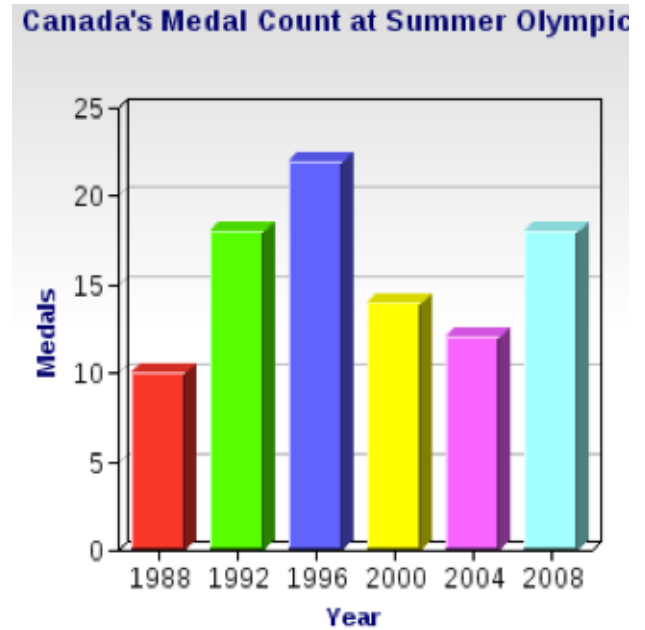


d) an arrow diagram.

Your Turn: Consider the relation represented by the graph.

Represent the relation:

- a) in words
- b) as ordered pairs
- c) as a table
- d) as an arrow diagram.



Practice

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2, 3, 4, 6, 7 a,b 8, Reflect